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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/502,454	02/11/2000	Naoki Soeda	F-9680	5175

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MCGINN & GIBB, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER

CHEN, TIANJIE

ART UNIT

PAPER NUMBER

2652

DATE MAILED: 08/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/502,454

Applicant(s)

SOEDA, NAOKI

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Final Rejection

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takao et al (JP 5-81848A).

With regard to claim 1, Takao et al shows a magnetic disk apparatus in Fig. 1 including: a disk enclosure 12-14, a first printed-circuit board 2a, which is paired with the disk enclosure, and a second printed-circuit board 2b, which is connected to the first printed circuit board 2a via a connection between connectors 3a and 3b ([0011] in English translation, attached) and is separated in structure from the first printed-circuit board 2a (Fig. 12); wherein the first printed-circuit board mounts circuits which have a first noise resistance property, and a circuit 24 which holds parameters unique to the disk enclosure ([0015]); and wherein the second printed circuit board 2b mounts circuits which have a second noise resistance property.

Takao et al does not show that the second printed-circuit board is connected to the first printed circuit board via cable between the connectors; the second noise resistance property is superior to the first noise resistance property, and wherein the circuits on the second printed-circuit board includes a switch for selecting either of a first group including one of the disk enclosure and one of the first printed-circuit

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board and a second group including another disk enclosure and another first printed-circuit board.

Office Notice is taken:

(1) Using a cable to connect a second printed-circuit board, which is usually in the main frame of a computer, with a first printed-circuit board, which is usually a disk drive, is a notoriously old and common practice in the art for connecting an external drive to a computer.

(2) It is a general practice in the art that the first printed-circuit includes a circuit reading signal from a disk and amplifying the signal and then converting it into a digital signal. The original signal read from the disk is on the order of tens of mv (10^{-2} Volts); therefore, the first noise resistance property could only resist a noise of millivolts (10^{-3} Volts). And the second printed-circuit board deals with digitized signal, which has amplitude of 3-5 volts; therefore, the second noise resistance property could resist a noise of hundreds of millivolts (10^{-1} Volts).

(3) As a general practice in the art, many computers are equipped with multiple disk drives (with first printed-circuit boards) and the main system of the computer communicates with the disk drives through the second printed-circuit board. The computer can communicate only one disk drive at one time, and can switch from one disk drive to another. This switching is controlled by the main system and realized by the second printed-circuit board.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use a cable for connecting the first and second printed-circuit board and find that the second noise resistance property is superior to the first noise resistance property, and wherein the circuits on the second printed-circuit board

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includes a switch for selecting either of a first group including one of the disk enclosure and one of the first printed-circuit board and a second group including another disk enclosure and another first printed-circuit board. The rationale is as follows: the cable for connecting is commonly used, the second noise resistance property could resist a noise of 10^{-1} Volts, which is superior to the first noise resistance property, which could only resist a noise of 10^{-3} Volts. To realize the selecting of disk drive by the second printed-circuit board, the second printed-circuit board must include a switch, which can be any type of switches, such as a mechanical, electrical, or electronic switch.

With regard to claim 2, Takao et al further shows that the first printed circuit board includes recording/reproduction control circuit 7 ([0014]).

With regard to claim 3, Takao et al shows an apparatus as described above, but does not explicitly show that circuit board 2a has an analog/digital converter.

But Takao et al shows that signal is read from the head by circuit 7 (line 1 in [0014]) and delivered to a logic operation circuit 6 (line 2 in [13]).

It would have been obvious to provide an analog/digital converter in circuit board 2a. The rationale is as follows: the logic operation circuit deals with digital signals, the signals read from the head are analog. Therefore, an analog/digital converter in 2a is a necessity to convert the analog signals from 7 into digital signals, then feeding it into the logic operation circuit 6 through the connectors 3a and 3b. One of ordinary skill in the art would have been expecting an analog/digit converter in the circuit board 2a for feeding digit signals into the logic operation circuit.

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With regard to claim 4, Takao further shows that the second printed circuit board includes an interface control circuit 5 ([0013]) with an upper system - the computer.

With regard to claim 5, Takao et al further shows that the circuits on the second printed-circuit board include a processor 4 and 6 ([0013]).

With regard to claim 6, Takao et al further shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

With regard to claim 7, Takao et al further shows that the first printed-circuit board further mounts a connector, which inherits some degree of elasticity.

With regard to claim 8, Takao et al shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

With regard to claim 9, Takao et al shows that the circuits on the second printed-circuit board further include a single processor 4 and 6 ([0030]).

With regard to claim 10, Takao et al further shows that the circuits on the second printed-circuit board include an interface circuit 5 ([0030]) with an upper system.

With regard to claim 12, Takao et al shows that the second printed-circuit board is separated into a third printed circuit board 5 and a fourth printed circuit 6; wherein the third printed circuit board mounts the interface control circuit 5 and wherein the fourth printed circuit board mounts the logic calculation circuits 6.

Takao et al does not show that the circuits on the fourth printed circuit board is better in noise resistance than the interference control circuit.

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But it would have been obvious at the time the invention was made to one of ordinary skill to expect that in Takao et al's device that the circuits on the fourth printed circuit board is better in noise resistance than the interference control circuit. The rationale is as follows: the interface control unit works with a current, which is much larger than the current in the logic operation circuit. And the logic operation circuit is much sensitive to the noise, because even a low level noise can cause miscalculation in the logic operation circuit. One of ordinary skill would have been motivated to make the fourth printed circuit board is better in noise resistance than the interference control circuit in order to ensure the logic operation circuit working properly.

With regard to claim 13, Takao shows that the circuits on the second printed-circuit board include an interface control circuit 5 ([0013]) with an upper system – the computer.

With regard to claim 14, Takao et al shows that the circuits on the second printed-circuit board include a processor 4 and 6 ([0013]).

With regard to claim 15, Takao et al shows that the circuits on the second printed-circuit board include a spindle motor/voice coil motor control circuit ([0027]).

With regard to claim 16, Takao further shows an embodiment in Fig. 3, wherein the second printed-circuit board is separated into a third printed circuit board 5 and a fourth printed-circuit board 6, and wherein the third circuit board 5 mounts an interface control circuit, and wherein the fourth printed circuit board 6 mounts the circuits other than the interface control circuit.

Response to Arguments

2. Applicant's arguments filed 06/07/2002 have been fully considered but they are not persuasive.

- Applicant repeatedly argues in pp. 6-7: the applied reference does not teach or suggest "the second printed circuit board including a switch."

Examiner's position: Applicant does not disclose any specific structural feature of the switch but only generally recited a "switch" in claims 1 and 16. As stated above, as a general practice, many computers are equipped with multiple disk drives (with the first printed-circuit board) and the main system of the computer communicates with the disk drives through the second printed-circuit board. The computer can communicate only one disk drive at one time, and can switch from one disk drive to another. This switching is controlled by the main system and realized by the second printed-circuit board. To realize the selecting of disk drive by the second printed-circuit board, the second printed-circuit board must include a switch, which can be any type of switches, such as a mechanical, electrical, or electronic switch.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is (703) 305-7499. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

TC
August 15, 2002


DAVID DAVIS
PRIMARY EXAMINER